

Fig. 1. — *Combretum robustum* : A, leaf; B, flower; C, scale from above. — *Combretum rabiense* : D, leaf; E, flower; F, flower cut length wise, petals and three stamens removed; G, scale from above. — *Combretum ivanii* : H, leaf; J, domatium, hairs removed; K, flower; L, scale from above.

fragrant. Receptacle greenish, covered by grey to brown hairs; lower receptacle ca. 1 mm long; upper receptacle 4-6 mm long and ca. 2 mm wide, long infundibuliform, hairy inside. Calyx lobes not conspicuous. Petals spatulate, obscure up to 1 mm long, glabrous. Stamens 2-seriate, ca. 4 mm exserted, yellow; anthers ca. 0.5 mm long. Style ca. 3 mm exserted, glabrous. Disc. inconspicuous. Fruit ca. 5.5 cm in diameter, with papery wings, glabrous; stipe up to 2 cm long.

MATERIAL EXAMINED. — GABON : *de Wilde & Jongkind 9600*, 35 km of Doussala, ca. 2°15' S-10°25' E, fl., March (BM, BR, K, LBV, M, MO, P, WAG; type). — CENTRAL AFRICAN REPUBLIC : *Eq. Tisserant 254*, Boukoko, 3°54' N-17°56' E, fl., Sept. (P, WAG); *Eq. Tisserant 1626*, Boukoko, fl., Oct. (P, WAG); *Eq. Tisserant 2365*, Boukoko, fr., Febr. (BM, BR, P, WAG); *Eq. Tisserant 2445*, Boukoko, fr. juv., Febr. (BM, P).

NOTE. — In flower *Combretum robustum* resembles *Combretum auriculatum* Engl. & Diels, but this second species has wingless fruits, in contrast with the large winged fruits of the new species. Because the branchlets of this species are rather stout it is called *C. robustum*. There are small differences in the shape of the petals and the receptacle between the collections of the two different localities, but the similarities are so dominating, that they almost certainly belong to the same species.

Combretum rabiense Jongkind, *sp. nov.* — Fig. 1, D-H; Fig. 2, B.

Liana magna. Folia elliptica in vivo papyracea vel coriacea, in sicco papyracea, venis majoribus puberulis aliter utroque latere glabra, basi attenuata, apice acuminata, mucronata. Inflorescentiae axillares et terminales, rachide velutina. Folia inflorescentias subtenentes viridule alba. Flores tetrameri sessiles. Receptaculum viride, basi velutinum. Receptaculum superius campanulatum. Lobi calycis deltoidei. Petala obovata ciliata aliter glabra alba. Stamina exserta, filamentis flavescentibus, antheris luteis. Stylus exsertus glaber. Fructus immaturus glaber.

TYPE : *Breteler, Jongkind, Mossavou & Wieringa 9807*, Gabon, Rabi oil-exploitation area, fl., fr. juv., March (holo-, WAG; iso-, BM, BR, K, LBV, M, MO, P).

Liana up to 40 m long. Branchlets velutinous. Petiole up to 1 cm long. Leaves elliptic, up to 20 × 10 cm, papery to leathery, puberulous on the larger veins, otherwise glabrous on both sides; 6-9 pairs of main lateral nerves, domatia inconspicuous, tertiary nervation almost parallel; base attenuate; apex acuminate, mucronate. Scales circular, 50-65 μm in diameter, with ca. 8 thick-walled cells, usually embedded in a glutinous exudate. Inflorescences axillary and terminal, rachis up to 4 cm long, velutinous. Leaves subtending the inflorescence greenish-white. Bracts ca. 2 mm long, puberulous. Flowers 4-merous, sessile, protogynous. Receptacle green; lower receptacle ca. 1.5 mm long, angular, velutinous; upper receptacle campanulate, 3.5 × 3 mm, puberulous. Petals obovate, 1.5-2 × 1.2-1.5 mm, ciliate otherwise glabrous, white. Stamens 1-seriate, ca. 5 mm exserted; filaments yellowish-white; anthers ca. 0.7 mm long, yellow. Disk glabrous except for the ca. 1 mm wide edge that is covered with long hairs, this edge hides the insertion of the stamens. Style ca. 3 mm exserted, glabrous. Immature fruit 3 cm long, winged, glabrous.

MATERIAL EXAMINED. — GABON : *Arends et al. 428*, Waka, near the "Falaise", 1°18' S-10°57' E, altitude 380 m, fl., Nov. (LBV, WAG); *Breteler et al. 9807*, Rabi oil-exploitation area, ca. 1°54' S-9°53' E,

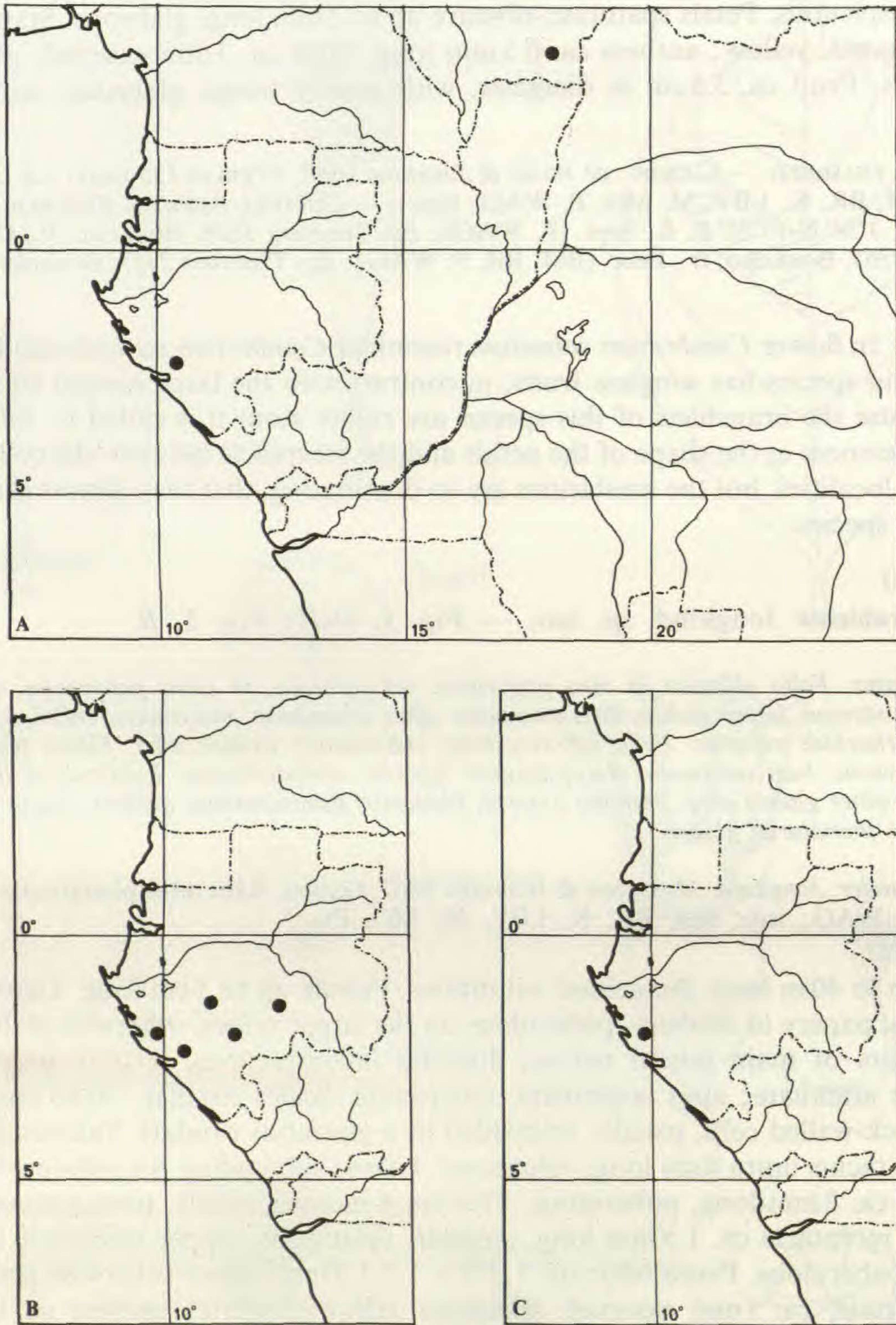


Fig. 2. — A, Distribution of *Combretum robustum*. — B, Distribution of *Combretum rabiense*. — C, Distribution of *Combretum ivanii*.

fl., fr. juv., March (BM, BR, K, LBV, M, MO, P, WAG; type); *de Wilde & Jongkind 9617*, 48 km along forest road Doussala-Bongo, ca. 2°15' S-10°25' E, alt. 270 m, fl., March (LBV, WAG); *Le Testu 8224*, Moucwala, 1°23' S-12°14' E, fl., Aug. (BR, P); *Louis & Nzabi 3000*, Ngounié Prov., forest road near Bilèngui, ca. 1°55' S-11°25' E, altitude 300-400 m, fl., fr. juv., April (LBV, WAG).

NOTE. — For a long time this species has been confused with *Combretum sordidum* Exell, with which it has much in common. The most obvious differences of *C. sordidum* with the new species are the narrower and glabrous petals and the longer anthers. The rich collection of the new species that was made in the Rabi area first made it clear that there existed a neglected second species mixed up with *C. sordidum*, therefore this species is called *Combretum rabiensis*.

Combretum ivanii Jongkind, *sp. nov.* — Fig. 1, J-L; Fig. 2, C.

Liana magna. Folia anguste ovata glabra sed aliter domatiis profulta, basi rotundata usque ad attenuata, apice longe acuminata. Inflorescentiae axillares et terminales, rhachidibus puberulis. Folia inflorescentias subtentes angusta et viridule alba. Bracteae lineares. Flores tetrameri sessiles odorantes. Receptaculum lepidotum. Receptaculum superius cupelliforme. Lobi calycis inconspicui acuti. Petala absentia. Stamina exserta, filamentis albis, antheris cordatis apiculatis luteis. Stylus exsertus glaber. Fructus ignotus.

TYPE : *van Nek 488*, Gabon, Rabi-Kounga R area, Pipeline track near the Rabi compound, fl., Dec. (holo-, WAG; iso-, LBV, MO, P).

Large woody liana. Branches up to 2 cm diameter. Wood with a transparent sticky exudate. Petiole up to 1 cm long. Leaves narrowly ovate, up to 12 × 6 cm, glabrous except for the domatia; 4-7 pairs of main lateral nerves with hairy pit domatia, tertiary nervation almost parallel; base rounded to attenuate; apex long acuminate. Scales circular to shallowly lobed, 45-90 μm in diameter, with usually 8 thick-walled cells, probably glandular. Inflorescences axillary and terminal, rachis up to 5 cm long, puberulous. Leaves subtending the inflorescence narrow and greenish-white. Bracts ca. 1 mm long, linear. Flowers 4-merous, sessile, protogynous, fragrant. Receptacle covered by a contiguous layer of scales; lower receptacle 1 mm long angular; upper receptacle cupuliform, 1 mm high and 1.5 mm wide, hairy inside. Calyx lobes not conspicuous, acute. Petals absent. Stamens ca. 2 mm exserted; filaments white; anthers cordate, ca. 0.3 mm long, apiculate, yellow. Style ca. 1.5 mm exserted, glabrous. Disc hairy. Fruit unknown.

MATERIAL EXAMINED. — GABON : *van Nek 488*, Pipeline track near the Rabi compound, ca. 1°54' S-9°53' E, fl., Dec. (LBV, MO, P, WAG; type).

NOTE. — By the very small flowers with a cupuliform upper receptacle and the absence of petals this species can be easily distinguished from others. The species is named after its collector IVAN VAN NEK.

Combretum falcatum (Welwitsch ex Hiern) Jongkind, *comb. nov.*

Quisqualis falcata WELWITSCH ex HIERN, Cat. Afr. Pl. Welw. 1 : 355 (1898). Type : *Welwitsch 4348*, Angola, Cuanza Norte, Golungo Alto, between Sanga and Bango, fl., fr. (holo-, BM; iso-, BR, K, P).

- Combretum mussaendiflorum* ENGLER & DIELS, Monogr. afr. Pflanzen. 3 : 87, tab. 25e (1899).
— *Quisqualis mussaendiflora* (ENGLER & DIELS) EXELL, Journ. of Botany 69 : 121 (1931). Type :
Deschamps s.n., Zaire, Mtowa, fl., June anno 1895 (holo-, BR).
- Combretum sericogyne* ENGLER & DIELS, Monogr. afr. Pflanzen. 3 : 87 (1899). Type : *E. Laurent s.n.*,
Zaire, Lusambo, fl., Dec. (holo-, BR).
- Combretum pellegrinianum* EXELL, Journ. of Botany 67 : 177 (1929), *syn. nov.*
— *Quisqualis pellegriniana* (EXELL) EXELL, Journ. of Botany 69 : 121 (1931) (not *sensu* KEAY,
Flora of W Trop. Afr., sec. ed. 1 (1) : 275 (1954) : *Talbot 498* is not this species but *Grif-
fonia physocarpa* BAILL., a *Caesalpinioidea*!). Type : *J. de Brazza 83*, Gabon, Ossiga, fl., fr.
(holo-, BM; iso-, P).
- Cacoucia littorea* ENGLER, Pflanzenwelt Ost-Afrikas und der Nachbargebiete, C : 293 (1895), *syn.*
nov.
— *Quisqualis littorea* (ENGLER) EXELL, Journ. of Botany 69 : 121 (1931). Type : *Volkens 147*,
Tanzania, Tanga, fl., fr., Febr. (syn-, B *delet.*; *lecto-*, designated here, BR; iso-, BM, E, K);
Holst 2061, fl., fr., Jan. (syn-, B *delet.*; iso-, HBG, K); *Holst 4034* (syn-, B *delet.*).

NOTE : The addition of two new synonyms does not really expand the variation of this species, only the ultimate dimensions of the flowers are somewhat extended.

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Anatomie florale des *Culcasia* (*Araceae*)

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Résumé : Les auteurs analysent la vascularisation florale de quatre espèces de *Culcasia* (*C. piperoides*, *C. saxatilis*, *C. scandens* et *C. striolata*) en vue de comprendre la nature des gynécées pseudo-monomères dans ce genre. La vascularisation florale des *Culcasia* présente peu de similitudes avec celle des *Philodendron*. Ces données sont discutées en rapport avec la classification des *Araceae* proposée par GRAYUM.

Summary : The authors analyse the floral vascularization of four species of *Culcasia* (*C. piperoides*, *C. saxatilis*, *C. scandens* and *C. striolata*) to better understand the nature of pseudomonomerous gynocia in this genus. The floral vascularization of *Culcasia* presents few similarities with that of *Philodendron*. These facts are discussed in relation of the classification of the *Araceae* as proposed by GRAYUM.

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INTRODUCTION

Les caractères floraux représentent un élément important dans la classification des sous-familles et des genres d'*Araceae*, famille qui compte 107 genres et 2 500 espèces (GRAYUM, 1990). A cause de sa grande variabilité d'un genre à l'autre, la fleur des *Araceae* se prête très bien à des études de morphologie comparée. Les principaux travaux traitant de l'anatomie florale des *Araceae* ont été réalisés par EYDE et al. (1967), FRENCH (1985a, 1985b, 1986a, 1986b, 1986c) et HOTTA (1971). A partir de leurs analyses, ces auteurs ont déduit des considérations phylogéniques et fait ressortir certains caractères importants pour la classification infra-familiale. Récemment GRAYUM (1990) a réalisé une synthèse de l'évolution des caractères floraux en rapport avec la phylogénie.

Depuis plusieurs années, une étude anatomique des caractères floraux de différents genres d'*Araceae* a été entreprise, au Jardin botanique de Montréal (e.g. BARABÉ & LABRECQUE, 1984; BARABÉ et al., 1986, 1987; BARABÉ & FORGET, 1988), dans le but de comprendre l'évolution de la fleur et la nature des gynécées pseudo-monomères que l'on rencontre fréquemment dans cette famille. Ces gynécées représentent un cas typique de réduction de l'appareil reproducteur femelle. Par gynécée pseudo-monomère nous entendons un gynécée syncarpe qui ne semble composé superficiellement que d'un seul carpelle.

ECKARDT (1937) insista sur le fait que les *Araceae* présentaient plusieurs cas de pseudo-monomérie. Dans cette famille, près de 40 % des genres possèdent des gynécées uni-oculaires